

# PATENT SPECIFICATION

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1209055

## DRAWINGS ATTACHED

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## (54) INSTANT TEA COMPOSITION AND PROCESS FOR THE PREPARATION THEREOF

(71) We, TENO BROOKE BOND LIMITED, a British Company of 35 & 37 Cannon Street, London, E.C.4, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a process for the production of an instant tea composition. The invention also relates to an instant tea composition which when dissolved in water to form a solution within the range of soluble solids concentrations normally found to be acceptable for drinking, will make a tea beverage with about the same concentration of volatile flavour components as would be present in a brew of normal black tea having the same soluble solids concentration.

Normal black tea is generally made from green tea leaf by (i) withering (ii) rolling or otherwise disintegrating (iii) "fermenting" (iv) firing. Rolling or other disintegration initiates the enzymic reactions of fermentation and when these are considered to have progressed sufficiently far the leaf is fired (i.e. dried). This arrests the enzymic reactions and the resulting product possesses the characteristic appearance of "black tea". (See, for example Millin, D. J. & Rustidge D. W. (1967) Process Bio-Chemistry 2 No. 6 page 9).

It has now been found that an instant tea composition which, when dissolved in water gives a solution with a content of volatile flavour components comparable with that of a brew of normal black tea containing a similar concentration of soluble solids, can be prepared by a process which involves the steaming of dhoor, which is fermented but unfired tea. The process of the present invention may result in the production of a hot water-soluble composition or, if desired, in the production of a cold water-soluble composition as hereinafter described.

According to the present invention there is provided a process for the production of ingredients for an instant tea composition which

comprises steaming dhoor and recovering a steam-vapour mixture which is condensed to form a distillate containing most of the volatile flavour components and a steamed dhoor portion which is subsequently fired and extracted to give a concentrate of soluble solids. The extraction is conveniently performed with hot water.

The steaming of the dhoor is most preferably conducted under vacuum. Thus it has been noted that when dhoor is steamed under atmospheric pressure, i.e. an absolute pressure of the order of 760 millimetres of mercury, there is a distinct colour change in the extract obtained from the residual steamed dhoor. However, when the dhoor is steamed under vacuum the colour change is diminished or obviated.

It has also been found that the quality of the final product can be improved if the extraction is carried out in an inert atmosphere, for example, an atmosphere of nitrogen or carbon dioxide.

The invention also provides an instant tea composition comprising the product obtained by drying an admixture of at least a steam distillate or concentrated steam distillate and an extract or concentrate of soluble tea solids produced by the above process.

The invention also provides an alternative composition comprising a steam distillate or concentrated steam distillate from dhoor and an extract or concentrate of normal black tea solubles.

The subsequent preparation of an instant tea composition from the ingredients prepared by the above process preferably involves treating the steam distillate either to concentrate it or to separate the essential oil, the resulting concentrate or essential oil containing most of the volatile flavour components of the tea, firing the steamed dhoor and extracting the fired steamed dhoor (DX) to give an extract of the water-soluble constituents herein referred to as DX solubles, admixing (1) the DX solubles, which may be used with or without

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- concentration as by evaporating, freeze concentrating or other methods, with (2) an extract of black tea, obtained by extracting normal black tea with hot water with or without concentration of the resulting liquor, and (3) the steam distillate, concentrated steam distillate or the essential oil obtained from the steam distillate, in desired proportions, to form a volatile-enriched liquor and subsequently drying the liquor. For convenience the various extracts or steam distillate above referred to may be concentrated prior to admixing. Also, in a modification of the process the fired steamed dhoor may be blended with the normal black tea leaf before extraction. The proportions of the mixture can be adjusted so that the resulting dried powder, when dissolved in water at an acceptable strength for drinking provides a beverage with about the same concentration of volatile flavour components as would be present in a similar brew of normal black tea. This is possible because dhoor has (on a dry weight basis) a much higher content of volatile flavour components than black tea; hence the quantity of volatiles added may be adjusted to compensate for process losses of volatiles in a way that is not possible when the starting material is black tea alone. The addition of volatiles may be made either to the extract of DX or to the extract of black tea before blending or to the blended extracts afterwards.
- An alternative instant tea composition may be prepared by admixing the extract of DX directly with the steam distillate, concentrated steam distillate or essential oil and drying the mixture.
- Alternatively the composition may comprise a water-soluble powder obtained by blending a mixture of the dried powders, preferably obtained by drying the concentrates. In this case the volatile addition would have been made to one or both of the separate extracts before drying or else the concentrated steam distillate or essential oil would be sprayed on or otherwise applied to the powder after drying.
- The present invention also provides an instant tea composition which comprises a water-soluble powder obtained by drying an admixture of the blend of (1) an extract of DX (containing DX solubles) and (2) an extract of black tea (containing black tea solubles) with (3) a steam distillate obtained from the steaming of dhoor or a concentrated steam distillate or an essential oil obtained from the steam distillate. The steaming of the dhoor is preferably conducted under vacuum. The DX solubles and black tea solubles may be obtained by extracting each type of leaf separately or by extracting an admixture of DX and black tea. The said blend of (1) and (2) is preferably in the proportion of 30% DX solubles to 70% black tea solubles. The amount of the volatiles or of the essential oil is selected to provide the optimum level of volatile flavour components in the admixture and is preferably between 65% and 100% of that available from the dhoor used. The optimum level of volatile flavour components in the admixture may be obtained by using part only of the steam distillate, essential oil or other components.
- In preparing the powder product, the volatile-enriched admixture may be dried in any suitable manner, such as by freeze-drying or spray-drying, for the hot water soluble product, but freeze-drying is preferred.
- With regard to the optimum level of flavour components in the admixture this depends not only upon consumer preference as to the content of such components in the final product but also upon the ratio of DX solids to black tea solids and the drying method employed. The preferred level of 65 to 100% of the volatile flavour components available from the dhoor applies specifically to the case where the ratio of DX solids to black tea solids is 3:7 and the drying method is freeze-drying. The optimum percentage of the available volatile flavour components decreases with decreasing proportions of black tea solids. Moreover, at any given ratio of DX solids to black tea solids the optimal addition of volatile flavour components would be for a spraydrying method approximately twice as great as for a freeze-drying method. The preferred quantity of volatile flavour components to add is also related to extraction yield: figures quoted are for a yield of 100% solubles close to 30% of the weight of the tea and DX used, but in the case of higher yields being obtained, relatively higher additions of volatiles would be desirable.
- In carrying out the process of the present invention, the dhoor starting material may be prepared by any of the methods employed in the industry and the production of the dhoor normally takes place in the country where the tea is grown. Thus, for example, freshly plucked tea-leaves (green leaf) are allowed to wither or not as the case may be and are prepared for fermentation as by trituration, rolling, Legg-cutting (i.e. leaf chopping), treatment in a "Rotorvane" (registered Trade Mark) or by crushing, tearing and curling (C.T.C.). The treated leaves are then fermented under suitable conditions to produce dhoor (Millin, D. J. & Rustidge, D. W. (1967) Process Biochemistry 2 No. 6 page 9). The dhoor is then subjected to the steaming process of the present invention. In this process steam is conducted through the dhoor, preferably under vacuum, for example at an absolute pressure of 190 to 508 millimetres of mercury. Advantageous results have been obtained by steaming at an absolute pressure of 190 to 350 millimetres of mercury.
- The resulting vapours may then be condensed upon issuing from the dhoor. The

- amount of distillate collected may be varied, for example up to 5.0 ml. of distillate may be collected for each gram (on a dry weight basis) of the dhoool used. Usually about 1.5 ml. of 5 distillate is collected for each gram (on a dry weight basis) of the dhoool used. The steam distillate, which contains most of the volatile flavouring components of the tea, is subsequently concentrated to produce a concentrate, normally an aqueous concentrate, of the volatiles or an essential oil and this concentration step may be performed in a number of ways, for example, by solvent extraction or atmospheric stripping. Thus the 10 steam distillate may be extracted with a suitable water-immiscible solvent and the solvent carefully evaporated to leave an essential oil fraction which is a nominal 10,000-fold concentration related to the dilute distillate.
- 15 Alternatively, the steam distillate may be conducted through a steam stripping column to concentrate the distillate to any desired concentration to provide a concentrated essence.
- 20 The steamed dhoool obtained by the preferred steaming at reduced pressure may be dried in a normal tea drier. The dried, volatiles-depleted leaf (DX) may be extracted in any batch or countercurrent fashion to 25 produce a concentrate, normally an aqueous concentrate, of DX solubles. This concentrate may be admixed with the concentrated essence prepared as described above, or with the essential oil prepared as described above or with a solution or dispersion of the essential oil at any desired concentration in water or other solvent, and the mixture dried to provide a water-soluble product which may be used as such. It is preferred that the extract 30 containing the solubles from the volatiles-depleted leaf (DX solubles) is mixed with a similar extract containing the black tea solubles, preferably in the proportion of three parts DX solubles to seven parts black tea 35 solubles, and the resulting blend mixed with the concentrated essence, essential oil or solution or essential oil and the resulting mixture dried by freeze-drying or other suitable means to provide a water-soluble instant tea composition.
- 40 It is to be noted that the preparation of the concentrated essence or essential oil from the volatile distillate and the preparation of the DX may take place in or near the country where the tea is grown. The extraction and 45 subsequent preparation of the instant tea composition, for example by admixture of the volatiles and the DX solubles with the solubles from black tea, may take place in the consuming country. The origin of the leaf used in the preparation of the black tea extract may be the same as or different from the green leaf used in the preparation of the dhoool providing the other ingredients, depend-
- 50 upon the nature of the product desired.

The overall process is illustrated schematically in the accompanying flow-sheet, (Fig. 1).

It has been found that the use of an inert gas atmosphere is beneficial for the storage of tea extract, for example the extracts obtained by extracting black tea or DX with water. The storage of extracts in an inert atmosphere is of benefit in any process for making instant tea because, although it is not desirable to store tea extract after extraction for any longer than is absolutely necessary, in practice there is usually an inevitable period when the tea liquor has to be held, following extraction, awaiting the next step in the process. Tea liquor stored during this period in an inert atmosphere produces a better quality final product than in the case where an inert gas is not used.

An inert gas atmosphere is also useful for the storage of concentrated volatiles.

The invention will now be more particularly described with reference to the accompanying drawing which is a diagrammatic representation of a pilot scale dhoool steamer, (Fig. 2).

Preparation of an instant tea incorporating dhoool volatiles, with 33 1/3% of the soluble solids being DX solubles and 66 2/3% being solubles from a conventional black tea blend.

The steamer illustrated in the drawing comprises a cylindrical vessel 1 surrounded by a jacket 2. At the base of the steamer is a steam inlet 3 which has flexible connections (not shown). A screen 4 is inserted at the bottom of the steamer and another screen 5 is placed at the top of the steamer. The top is easily removable. An outlet 6 is provided at the top of the steamer for carrying the steam and volatiles to a condenser (not shown).

Water at a temperature of 76.5°C. is circulated through the jacket of the steamer. The screen 4 is inserted at the bottom of the steamer. The bottom of the steamer is secured with the aid of a gasket. Pre-weighed dhoool is loaded into the steamer. The screen 5 for the vapour line is put in place and the top of the steamer is secured. A distillate receiver is secured to the condenser (not shown) and the condenser cooling water is turned on. The vacuum pump is started and air bleed valve adjusted to maintain a vacuum of 300 Torr. in the steamer. Steam at a pressure of 3 p.s.i.g. (0.211 Kg./sq.cm.) is introduced to the steamer through the steam inlet at a rate of about 80 cc./min. and held at this rate until vapours start to condense. The vacuum is then set to 280 Torr. and the steam rate increased to 160 cc./min.; vacuum to 250 Torr. and steam rate to 200 cc./min.; vacuum to 240 Torr. and steam rate to 215 cc./min. This rate and vacuum are held constant for the remainder of the

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run. The temperature of the vapour issuing from the steamer is 70°C.

The dhoool used for this run was prepared as follows: green leaf was withered, put through a "Rotovane" and fermented. Ten pounds of the dhoool was put into the steamer. The moisture content was 69.7%, so the dry weight was 3.03 lb. or 1376 gm. The distillate collected was based on a take off of 3 cc. of distillate per gm. dry weight, of leaf. The amount of distillate collected in this run was 4128 cc. The rate of collection was 192 cc./min. Since the charge to the steamer was 3.03 lb. of leaf (dry weight basis) and the rate of distillate collection was 192 cc./min., the rate was equivalent to 192 divided by 3.03 or 63 cc./min./lb. (0.139 cc./min./gm.) of dry leaf (dry weight basis). When the steaming cycle was completed the steamed dhoool was dropped out of the steamer. The steamed dhoool was subsequently fired in a small tea drier, and the dilute distillate concentrated tenfold by atmospheric pressure steam stripping.

The steamed dhoool was thinly spread on an aluminium sheet on a concrete floor to accelerate cooling. The drier used was a hot air tray drier. The inlet temperature was 90.5° to 96°C., and the outlet temperature was 40.5° to 49°C. One and one half pounds of the steamed dhoool was thinly spread on a tray. The tray was inserted at the bottom of the drier (furthest from the inlet air duct). After five minutes, the first tray was raised towards the inlet air duct and another loaded tray inserted below the first one. This procedure was repeated until six loaded trays were in the drier. At this point the first tray was directly below the inlet air duct and had been exposed to the hot air for 30 minutes. The first tray was then removed and considered to be dry. Another freshly loaded tray was put into the bottom of the drier and the procedure continued until all of the steamed dhoool was converted into DX.

The column used for atmospherically concentrating the dilute distillate is in two sections. Both sections are fully packed with Raschig rings. The stripping section is 7.6 cm. in diameter and 71 cm. high. The rectifying section 3.2 cm. in diameter and 56 cm. high. The feed is introduced between the two sections. The feed is at ambient temperature, i.e. 18° to 24°C. Heat is supplied to the lower flask (5 litre capacity) by a gas burner. The vapours are condensed and collected from the rectifying section into a graduated cylinder. The feed is controlled by a stopcock. The extent to which the feed is concentrated in steam stripping is calculated from the amount of distillate collected in the graduated cylinder and the amount of dilute distillate fed into the stripper. An attempt is made to collect 10 cc. of distillate for every 100 cc. that is fed into the stripper.

The DX was packed into polyethylene bags and heat sealed and the concentrated distillate stored in a refrigerator until required for subsequent admixing with the tea solubles.

The DX and concentrated volatiles were converted into instant tea as described below.

The DX and the concentrated distillate were received in polyethylene bags and glass bottles, respectively, prepared as described above. The quantities were 60 lbs. (26.215 Kgs.) of DX and 8172 ml. of concentrated distillate; these being the combined output of a number of runs in the steamer.

The apparatus used for the extraction of the DX was a pilot counter current screw extractor manufactured by Niro Atomizer A/S., Copenhagen. This consists of an enclosed horizontal trough, 1.25 m. × 15 cm. which is capable of being raised to an angle of from 0 to 18° above the horizontal. The trough is partially encased by three independent jackets which may be heated by steam and it has a glass lid with a gap at both ends. At the lower end of the trough is a sieve plate with fine holes, these being kept clear by two adjustable scraper blades which form the lower end of the rotor. At the upper end of the trough is a plate which acts as a weir over which the extracted DX is discarded; this is also kept clear by two small scraper blades.

In operation, the DX is added at the lower end of the chamber at a point just higher than the sieve plate. It is conveyed up the trough by the motion of the helical screw and is discharged over the plate at the top of the extractor.

Prior to commencing the extraction the machine was set at an angle of 13.5° and a rotor speed of 8.5 rpm. The trough and rotor were thoroughly heated with a steam hose but on this occasion the heated jacket was not used. Water at a temperature of 94° to 95°C. was introduced at a rate of about 1200 ml./min. The DX was then introduced at the lower end of the extractor at a rate of about 200 g/min. and this rate was controlled manually.

The extract was collected from the lower end of the extractor below the sieve plate and was passed through a 200 mesh (74 microns) wire sieve (200 A.S.T.M.) where any remaining particles were removed before collection. After 2½ hours when 60 lbs. (26.215 Kgs.) of DX had been extracted, 75 litres of extract had been collected. This extract had a solids content, as determined by a hand sugar refractometer, of 11% (w/v), however, on carrying out a gravimetric solids determination at 70°C. in a vacuum oven, the true solids concentration was found to be 8.87% (w/v.). This was a yield of 24.4% soluble solids from the DX (no account was taken of the small residual moisture content of the DX).

The stated yield is for a very small pilot example; the corresponding figure for a larger scale continuous production operation would be much greater.

5 From the 75 litres of extract, portions were taken as follows for the addition of the concentrated essence:

1. 5 litres without any addition of volatile material.
- 10 2. 6 litres with 654 ml. of concentrated essence added.
- 15 3. 6 litres with 1308 ml. of concentrated essence added.

Each 0.3 ml. of the concentrated essence had been obtained from 1 g. (dry weight basis) of dhoool: hence, the dhoool from which

20 60 lbs. (26.215 kgs.) of DX was obtained had also yielded 8172 ml. of concentrated essence. From 60 lbs. of DX there was

25 obtained 75 litres of extract. Hence, if it were desired to add to the extract 100% of the dhoool volatiles obtained in the course of preparing that weight of DX used in making the extract, the volume of the concentrated essence of dhoool volatiles to add to 75 litres of extract

would be 8172 ml., or 109 ml. for each of extract. Sample 2 employed exactly this ratio, whereas in sample 3 this volatile content was doubled. Therefore, a brew prepared from

30 sample 2 would be as rich in volatiles as a brew of dhoool itself: sample 3 would be twice as rich. Dhoool brew itself is too rich in volatiles, being several times richer on a dry weight basis than black tea; hence it follows that

35 powders from samples 2 or 3 have to be blended with a large proportion of powder from sample 1 to achieve the optimum volatile content for drinking. In manufacturing practice, as opposed to a pilot scale example, the

40 extract would not be divided into portions with different additions of volatiles; instead the whole of the extract would be enriched with a known optimum volatile addition.

Additionally further fractions were blended 45 with twice their respective volumes of black tea extract of the same solids concentration. This tea extract was prepared from a blend of conventional black teas which were extracted in an apparatus manufactured by Niro 50 Atomizer A/S., Copenhagen, similar to that described above but of much larger dimensions and with two parallel contra-rotating rotors. These further fractions were prepared as follows:

55 4. 2 litres of DX extract + 4 litres of black tea extract without addition of volatile material.

5. 2 litres of DX extract + 4 litres of black tea extract with the addition of 1308 ml.

60 of concentrated essence. Powder from sample 5, like that from samples 2 and 3, would be over-rich with volatiles and would require to be blended with a large proportion of powder from sample 4.

65 5 litres of each fraction were frozen in

aluminium trays of 60 cm.  $\times$  60 cm.  $\times$  3 cm. in a deep freeze, to give a layer thickness of 1.4 cm. Thermocouples were placed both deep in the liquid extract before freezing and on the surface after it had frozen. These trays were freeze dried in a Vickers Pilot freeze drier with a product temperature not exceeding 40°C. After drying time of about 48 hours, the dried soluble tea solids were removed and packed in polyethylene bags which were stored in metal tins.

70 By using the powder (from samples 1 and 4) to which no concentrated essence had been added and blending this with samples with the added concentrated essence, samples suitable for tasting were prepared.

75 It was found that where the soluble solids were obtained entirely from DX the preferred blend was three parts of sample 1 with one part of sample 2, or alternatively seven parts of sample 1 with one part of sample 3. This corresponds to the use of 25% of the volatiles available from the weight of dhoool used to manufacture the weight of DX from which the soluble solids were extracted.

80 Where two thirds of the solid fraction was obtained from black tea, the preferred blend for tasting was 17 parts sample 4 with 3 parts of sample 5. This corresponds to use of 90% of the volatiles available from the weight of dhoool used to manufacture the DX from which the DX solubles in the composition were extracted.

85 Preparation of an instant tea incorporating dhoool volatiles with 30% of the soluble solids being DX solubles and 70% being solubles from a conventional black tea blend.

90 In this Example all stages of the method up to the extraction were carried out as previously. The quantity of DX extracted was 20 lbs. (9.072 Kgs.) and the operating conditions used were, screw speed 8.5 rpm, angle of elevation 13.5°, water input about 700 ml./min. and tea input about 108 g/min. The amount of extract collected was 24.75 litres having a solids concentration as determined by a hand sugar refractometer (after correcting for temperature and nature of solid material) of 10.5% w/v. After all the DX has been introduced into the extractor, the extract concentration fell and a further 4.5 litres of extract was collected with a solids concentration of 5.0% w/v. This extract was discarded but the volume obtained and solids concentration of the discarded material were used for the calculation of the yield.

95 Extract collected 24.75 litres  
solids conc. 10.5% = 2600 g.

Extract discarded 4.5 litres  
solids conc. 5.0% = 225 g. 105

110 2825 g.  
But this was extracted from 20 lbs. = 9072 g.  
of DX

115 ∴ yield in extraction = 31.2%.

Each 0.3 ml. of the concentrated essence had been obtained from 1 g. (dry weight basis) of dhoool; hence, the dhoool from which 20 lbs. (9.702 Kgs.) was obtained had yielded also 5 2722 ml. of concentrated essence. From 20 lbs. of DX there was obtained 29.25 litres of extract. Hence, if it were desired to add to the extract 100% of the dhoool volatiles obtained in the course of preparing that weight 10 of DX used in making the extract, the volume of the concentrated essence of dhoool volatiles to add to 29.25 litres of extract would be 2722 ml. or 93.06 ml. for each litre of extract.

The 24.75 litres of extract at concentration 15 10.5% w/v was mixed in the ratio of 3:7 with a black tea extract which was prepared in the larger extractor as before. The solids concentration of this black tea extract was 12.0% w/v and therefore the quantity required 20 to give a ratio of 3:7 on an equal concentration basis was

$$\frac{7}{3} \times \frac{10.5}{12} = 50.4 \text{ litres};$$

to give a total volume of 75.15 litres. A 20 litre portion of this was removed for freeze 25 drying in a Vickers Pilot drier as previously, without addition of concentrated essence.

The quantity of essence which was added to the remaining blended extracts (55.15 litres) was 1528 ml. which corresponds to the use of 30 90.4% of the volatiles available from the weight of dhoool used to manufacture the DX from which the DX solubles in the composition were extracted.

This extract with the added concentrated 35 essence was frozen in a proprietary freezer and the resulting small blocks were freeze-dried in a Vickers production plant with a maximum product temperature of 50°C. The dry soluble tea solids were packed in a large polyethylene bag and then transferred to tightly sealed glass 40 jars.

The general and specific procedures described above result in the production of an instant tea composition which is basically hot water-soluble. However, the invention is also applicable to the production of a cold water-soluble 45 composition.

For a cold water-soluble instant tea composition the volatile-containing distillate, concentrated distillate or essential oil is prepared by any of the methods hereinbefore described. The leaf extract(s) containing DX solubles, black tea solubles or a mixture thereof would 50 also be prepared as hereinbefore described. They might be at almost any concentration, 55 but are preferably at about 9% w/v.

At this stage the extract or extracts would be cooled to a temperature of 7° to 10°C. and held with slow agitation for about one hour. 60 The cooled extract is then centrifuged to give a supernatant liquor, which will be perfectly

clear when diluted with water at a temperature of 7°C. and a heavy precipitate. The precipitate is diluted with hot water to give a concentration of 10% solids and the pH of the solution is adjusted to 8.5 with a solution of sodium hydroxide. The adjusted solution is heated to a temperature of 93° to 99°C. for ten minutes, cooled to 66°C. and a weight of 65 30% hydrogen peroxide solution added which is equal to the weight of tea solids treated. The solution is then heated to a temperature of 93° to 99°C. with vigorous agitation for 10 minutes, cooled to 27°C. its pH adjusted to 5.0 to 5.4 with 85% phosphoric acid, and the mixture centrifuged to give a supernatant which is perfectly clear when 70 diluted with water at a temperature of 7°C. and a precipitate which is discarded. The clear supernatant solutions from the original centrifugation and the clear supernatant from the treatment of the original insolubles are mixed. The whole of the above is referred to as the "reclaim" procedure.

Before the volatiles are added the extracts may or may not be further concentrated (for example, by evaporation or freeze-concentration). The volatiles are then mixed with the extract(s) as hereinbefore described and dried as hereinbefore described except that freeze-drying is not necessarily the preferable method.

In the preparation of a hot-water soluble composition or a cold water-soluble composition, but especially the latter, the black tea component may be steamed or vacuum steamed prior to extraction to recover a distillate containing black tea volatiles. The purpose of doing this is to avoid losses of black tea volatiles during extraction and subsequent concentration of the extract. The distillate containing black tea volatiles would then be added (along with the volatiles from the steaming or vacuum steaming of dhoool) to the mixed extracts of black tea and DX before the drying step.

#### WHAT WE CLAIM IS:—

1. A process for the production of ingredients for an instant tea composition which comprises steaming dhoool and recovering a steam-vapour mixture which is condensed to form a distillate containing most of the volatile flavour components and a steamed dhoool portion which is subsequently fired and extracted to give a concentrate of soluble 110 solids.

2. A process according to claim 1, in which the extraction is performed with hot water.

3. A process according to claim 1 or 2, in which the steaming of the dhoool is conducted under vacuum.

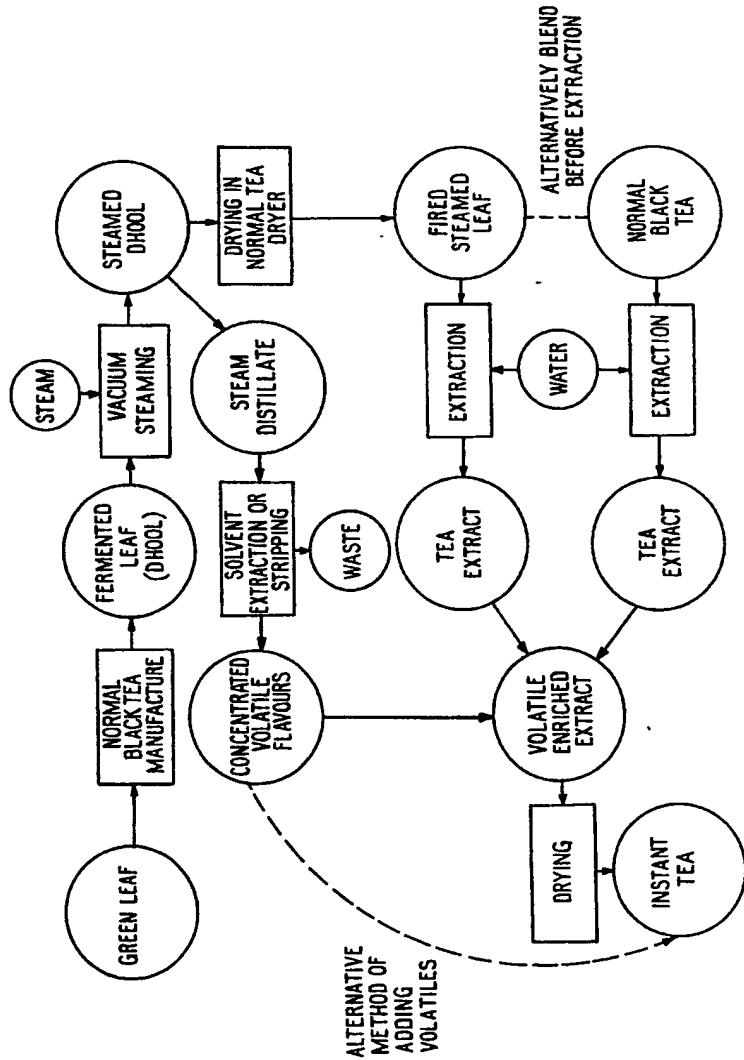
4. A process according to claim 3, in which the steaming is conducted at an absolute pressure of 190 to 508 millimetres of mercury.

5. A process according to claim 3, in which 125

- the steaming is conducted at an absolute pressure of 190 to 350 millimeters of mercury.
6. A process according to any one of the preceding claims, in which the extraction is carried out in an inert atmosphere.
7. A process for the preparation of an instant tea composition from the ingredients produced by the process of claim 1, which comprises treating the steam distillate either to concentrate it or to separate the essential oil, the resulting concentrate or essential oil containing most of the volatile flavour components of the tea, firing the steamed dhoool and extracting the fired steamed dhoool (DX) to give an extract of DX solubles, admixing (1) the DX solubles, with (2) an extract of black tea and (3) the steam distillate, concentrated steam distillate or the essential oil obtained from the steam distillate, in desired proportions and concentrations, to form a volatile-enriched liquor and subsequently drying the liquor.
8. A process according to claim 7, in which the various extracts or steam distillate are concentrated prior to admixing.
9. A modification of the process according to claim 7, in which the fired steamed dhoool is blended with normal black tea leaf before extraction.
10. A process according to claim 7, 8 or 9, in which the volatile-enriched admixture is dried by freeze-drying or spray-drying.
11. An instant tea composition comprising the product obtained by drying an admixture of at least a steam distillate or concentrated steam distillate and an extract or concentrate of soluble tea solids produced by the process according to claim 1.
12. An instant tea composition comprising a steam distillate or concentrated steam distillate from dhoool and an extract or concentrate of normal black tea solubles.
13. An instant tea composition which comprises a water-soluble powder obtained by drying an admixture of the blend of (1) an extract of DX, containing DX solubles, and (2) an extract of black tea, containing black tea solubles, with (3) a steam distillate obtained from the steaming of dhoool or a concentrated steam distillate or an essential oil obtained from the steam distillate.
14. A composition according to claim 12, in which the blend of (1) and (2) is in the proportion of 30% DX solubles to 70% black tea solubles.
15. A composition according to claim 13, in which the blend of (1) and (2) is obtained by blending fired steamed dhoool and normal black tea leaf before extraction.
16. A composition according to claim 13, 14 or 15, in which the amount of ingredient (3) is between 65% and 100% of that available from the dhoool used.
17. A process according to claim 1 for the production of ingredients for an instant tea composition substantially as hereinbefore described.
18. A process according to claim 7 for the preparation of an instant tea composition substantially as hereinbefore described.
19. An instant tea composition whenever prepared by a process according to any one of claims 7 to 10 and 18.
20. An instant tea composition according to claim 11, and substantially as hereinbefore described.

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1209055

COMPLETE SPECIFICATION

2 SHEETS

*This drawing is a reproduction of  
the Original on a reduced scale*

Sheet 2

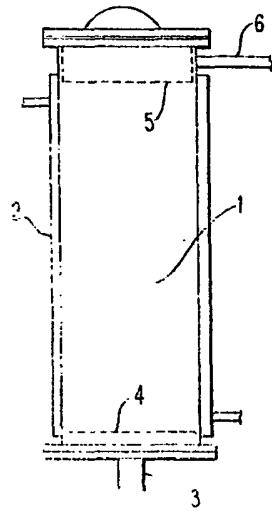


FIG. 2